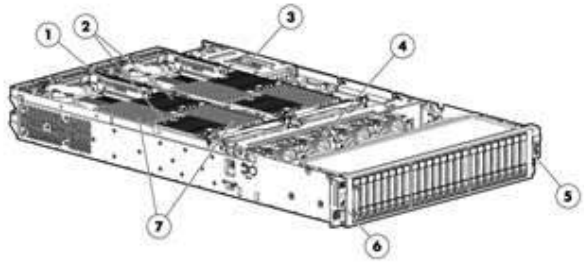
Overview

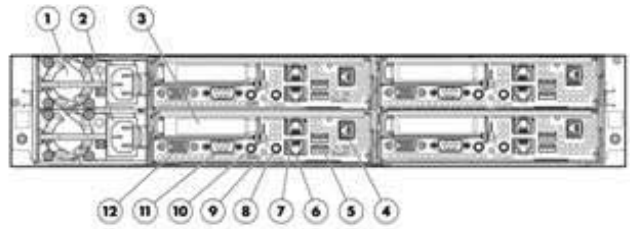
The DL2000 is optimized for efficiency, density and flexibility and a server node can be serviced individually without impacting the operation of other server nodes sharing the same chassis. The DL2000 consists of up to 4 independent DL170e G6 servers in the 2U HP ProLiant e2000 G6 Chassis. The servers share power supplies and fans, providing greater power and cooling efficiencies.

The DL2000 was designed to double the density to maximize data center floor space, increase performance while lowering energy consumption and provide flexible configurations that fit into existing industry standard racks.

Each DL170e G6 server node supports up to two Intel® two processors and 16 DDR3 DIMM sockets. The DL170e G6 provides all of the features expected in an enterprise server, including essential management features (LO100i) and Easy Setup for rapid deployment, but at a low cost.

4 Node 24 SFF HDD Model Illustrated





Front View:

1. 1U Node PCIe Riser - Low Profile PCIe x16 Gen2 Slot
2. Intel® Xeon® 5500 or 5600 series processors (supports up to two per node)
3. Common Slot Power Supply (two supported per chassis)
4. 4 x 80mm system fans
5. Standard Right Power Buttons, Chassis UID, Health LEDs
6. Standard Left Power Buttons, Health LEDs
7. 16 DDR3 DIMM slots

Rear View:

1. Common Slot Power Supply
2. Power supply cable socket
3. Low-Profile PCI Express x16 Gen2 slot
4. Optional dedicated management port (RJ-45)
5. Two USB ports
6. One GbE LAN port (RJ-45)
7. One GbE LAN port with shared management (RJ-45)
8. Power Button
9. Health LED
10. UID Button
11. Serial Port
12. Video Port

What's New

- Support for HP 900GB 6G SAS 10K 2.5in ENT HDD
- Support for the latest Intel Xeon 5600 Series processors

Standard Features

NOTE: For the Standard Features shipped in the Factory Integrated Models, please see the "Configuration Information - Factory Integrated Models" section.

Processor One of the following depending on Model	Six-Core Processors Intel® Xeon® X5675 (3.06GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) Processor Intel® Xeon® X5670 (2.93GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) Processor Intel® Xeon® X5660 (2.80GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) Processor Intel® Xeon® X5650 (2.66GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) Processor Intel® Xeon® E5649 (2.53GHz/6-core/12MB/80W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) Processor Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) Processor Intel® Xeon® L5640 (2.26GHz/6-core/12MB/60W, DDR3-1333, HT, Turbo 2/2/3/3/4/4) Processor Four-Core Processors Intel® Xeon® E5640 (2.66GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor Intel® Xeon® E5630 (2.53GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor Intel® Xeon® L5630 (2.13GHz/4-core/12MB/40W, DDR3-1066, HT, Turbo 1/1/2/2) Processor Intel® Xeon® E5607 (2.26GHz/4-core/8MB/80W, DDR3-1066) Processor Intel® Xeon® E5603 (1.60GHz/4-core/4MB/80W, DDR3-1066) Processor Intel® Xeon® E5506 (2.13GHz/4-core/4MB/80W, DDR3-800) Processor NOTE: HT indicates that the processor model supports Intel® Hyper-Threading Technology NOTE: Turbo indicates the maximum potential frequency increment when using Intel® Turbo Boost Technology, with 6, 5, 4, 3, 2, and 1 cores active. NOTE: DDR3 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed. NOTE: For the Intel 5000 Series, the letter preceding the model number indicates the performance/wattage of the processor. "X" denotes High Performance/Wattage; "E" denotes Enterprise Performance/Wattage (Mainstream), and "L" denotes Lower Wattage. NOTE: Up to 2 processors supported. Mixing different processor models is not supported.
Cache Memory	12MB (1 x 12MB) Level 3 cache NOTE: All 5600 processor models except those noted below. 8MB (1 x 8MB) Level 3 cache NOTE: For processor E5607. 6MB (1 x 6MB) Level 3 cache NOTE: For processor E5603. 4MB (1 x 4MB) Level 3 cache NOTE: For processor E5506.
Chipset	Intel® 5520 Chipset NOTE: For more information regarding Intel chipsets, please see the following URL: http://www.intel.com/products/server/chipsets/

Standard Features

Upgradeability

Upgradeable to two processors (12 cores)

Memory Protection

Advanced ECC (multi-bit error protection)
Mirroring mode
Lockstep mode

Memory

Type	DDR3 Registered (RDIMM) and Unbuffered (UDIMM)
Maximum (RDIMM) (per server node)	192GB (12 x 16GB) PC3-8500R (DDR3-800)
Maximum (UDIMM) (per server node)	48GB (12 x 4GB) PC3-10600E (DDR3-1333)

NOTE: Depending on the memory configuration and processor model, the memory speed may run at 1333MHz, 1066MHz, or 800MHz. Please see the Online Memory Configuration Tool at http://www.hp.com/go/ddr3memory-configurator

Network Controller

HP NC362i Integrated Dual Port Gigabit Server Adapter

Expansion Slots

- Half Height Nodes (1U): One available PCI Express Gen 2.0 slots:
  - Slot 1: Low profile PCI-Express 2.0 x16
- Full Height Nodes (2U): three available riser options
  - Option 1: Up to three available PCI-Express Gen 2.0 slots:
    - Slot 1: full-height/full-length PCI-Express 2.0 x16
    - Slot 2: full-height/half-length PCI-Express 2.0 x4
    - Slot 3: low-profile PCI-Express 2.0 x4
  - Option 2: Up to three available PCI-Express Gen 2.0 slots:
    - Slot 1: full-height/full-length PCI-Express 2.0 x8
    - Slot 2: full-height/half-length PCI-Express 2.0 x8
    - Slot 3: low-profile PCI-Express 2.0 x8
  - Option 3: Up to two available PCI-Express Gen 2.0 slots:
    - Slot 1: full-height/full-length PCI-Express 2.0 x16
    - Slot 3: low-profile PCI-Express 2.0 x8

Full-height PCIe Riser Option	Expansion Slots #	Technology	Bus Width**	Connector Width*	Bus Number	Form Factor	Notes
	1	PCI-Express 2.0	x16	x16	4	Full height, full length	3.3 volts
	2	PCI-Express 2.0	x4	x4	6	Full height, half length	3.3 volts
	3	PCI-Express 2.0	x4	x4	7	Low Profile	3.3 volts

Full-height PCIe Riser Option	Expansion Slots #	Technology	Bus Width**	Connector Width*	Bus Number	Form Factor	Notes
	1	PCI-Express 2.0	x8	x8	4	Full height, full length	3.3 volts
	2	PCI-Express 2.0	x8	x8	5	Full height, half length	3.3 volts

Standard Features

	3	PCI-Express 2.0	x8	x8	7	Low Profile	3.3 volts
Full-height PCIe Riser Option	**Expansion Slots #**	**Technology**	**Bus Width****	**Connector Width***	**Bus Number**	**Form Factor**	**Notes**
	1	PCI-Express 2.0	x16	x16	4	Full height, full length	3.3 volts
	3	PCI-Express 2.0	x8	x8	6	Low Profile	3.3 volts
Half-height PCIe Riser (Standard with half-height 1U nodes)	**Expansion Slots #**	**Technology**	**Bus Width****	**Connector Width***	**Bus Number**	**Form Factor**	**Notes**
	1	PCI-Express 2.0	x16	x16	4	Low Profile	3.3 volts

* Default bus assignment. Inserting cards with PCI bridges may alter the actual bus assignment number.

** Indicates the number of physical electrical lanes running to the connector.

Storage Controller	Non-Hot Plug SATA Models	Embedded HP Smart Array Hot Plug Advanced Pack for B110i (RAID 0, 1, 10) NOTE: Transfer rate: up to 3 Gb/s SATA NOTE: To enable RAID on Embedded SATA (Windows and Linux only), use the HP Smart Array B110i SATA Raid controller, To enable use of the B110i, enter the ROM based setup utility(RBSU). The option for enabling RAID can be found in the advanced section of the RBSU. For additional details www.hp.com/go/SATARAID. For RAID on Solaris, a Smart Array Controller must be purchased.
	Hot Plug SATA Models	Embedded HP Smart Array Hot Plug Advanced Pack for B110i (RAID 0, 1, 10) NOTE: Transfer rate: up to 3Gb/s SATA NOTE: The HP Smart Array B110i SATA Raid Hot Plug Advance Pack provides the hot-plug and RAID support for the embedded SATA controller. The Hot Plug Advance kit is a License to enable the RAID support on Hot Plug models. It supports up to six 3G SATA hard disk drives. It will support a maximum of two (2) logical drives. It supports Raid 0, 1 and 1+0. For additional details www.hp.com/go/SATARAID
	Hot Plug SAS/SATA Models	HP Smart Array Controller RAID 0,1,10, 5 NOTE: Transfer rate: up to 6GB/s SAS, 3Gb/s SATA

NOTE: SAS Upgrade: A HP Smart Array Controller is required for SAS HDD support. Transfer rate: 6.0 Gb/s SAS supported.

NOTE: If a Smart Array P410 Controller is added after initial purchase (e.g. an upgrade) a HP DL170e G6 P410 CONTROLLER CABLE OPTION KIT (P/N 612206-B21) must be ordered to connect the Smart Array Controller to the adapter board.

NOTE: If any Smart Array Controller other than the P410 is added after initial purchase (e.g. an upgrade), an HP DL170e G6 SMART ARRAY CONTROLLER CABLE OPTION KIT (P/N 612207-B21) must be ordered to connect the Smart Array Controller to the adapter board.

NOTE: An external diskette drive, USB floppy drive key or virtual FDD using LO100 Advanced Pack is needed to install storage controller drivers during a Windows operating system installation from a CD.

Standard Features

Internal Storage Devices	Diskette Drives	Via USB only
	Optical Drives	DVD drive via USB only (External support only)
	Hard Drives	None ship standard
	Drive Bays One of the following depending on Model	Up to 8 or 12 Hot plug SAS/SATA 3.5" drives Up to 16 or 24 Hot plug SAS/SATA 2.5" drives NOTE: The 12 LFF HDD cage is available for special large volume configurations only. Please contact your HP representative for details.

Maximum Internal Storage	LFF 3.5" Hot Plug SATA	16.0TB	8 x 2TB
	LFF 3.5" Hot Plug SAS	16.0TB	8 x 2TB
	LFF 3.5" Hot Plug SATA	24.0TB	12 x 2TB
	LFF 3.5" Hot Plug SAS	24.0TB	12 x 2TB
	SFF 2.5" Hot Plug SATA	16.0TB	16 x 1TB
	SFF 2.5" Hot Plug SAS	16.0TB	16 x 1TB
	SFF 2.5" Hot Plug SATA	24.0TB	24 x 1TB
	SFF 2.5" Hot Plug SAS	24.0TB	24 x 1TB

NOTE: The 12 LFF HDD cage is available for special large volume configurations only. Please contact your HP representative for details.

Interfaces	Serial	1
	Network RJ-45 (Ethernet)	2 10/100/1000 NIC ports (1 NIC shared for the HP ProLiant Lights Out 100i Remote Management)
	Graphics	1
	Management	1 Optional Dedicated LO100i Management Port
	Health LED	2 (1 front and 1 rear) per server node
	Power	2 (1 front and 1 rear) per server node
	UID	1 rear per server node and 1 upfront system UID
	USB	3 (two rear, one internal) NOTE: Please see the following URL for additional information regarding USB support: http://h18004.www1.hp.com/products/servers/platforms/usb-support.html.

Industry Standard Compliance	ACPI V2.0 Compliant
	PCI 2.2 Compliant
	PXE Support
	WOL Support
	Microsoft® Logo certifications
	IPMI 2.0, DCMI 1.0. SMASH CLP compliant

Standard Features

Graphics	Integrated Matrox Graphics G200e, 32MB Standard • 16 bit color: maximum resolution of 1600 x 1200 • 32 bit color: maximum resolution of 1280 x 1024 The following NVIDIA graphics cards are tested for compatibility in the DL2000 (when using full-height 2U nodes): • NVIDIA Quadro 6000 512MB PCIe x 16 graphics card • NVIDIA Quadro FX5800 512MB PCIe x 16 graphics card • NVIDIA Quadro 4000 512MB PCIe x 16 graphics card • NVIDIA Quadro FX3800 512MB PCIe x 16 graphics card NOTE: For more information on the latest visualization and acceleration qualification status, please see http://www.hp.com/go/accelerators NOTE: An HP DL170e GPU Adapter Kit (P/N 612253-B21) is required when installing this NVIDIA card. The NVIDIA cards can only be installed in the 2U node with the 2 slot full-height riser option: HP DL170e I/O Riser PCIe x16 x8 FIO option (P/N 512481-B21).
Server Power Cords	One 6' Highline (IEC-IEC) power cord ships standard NOTE: HP ProLiant DL servers are primarily connected to PDU's in data center racks so they ship standard with only a PDU power cord (416151-B21). If a user wishes to power a ProLiant DL server using a 110V receptacle (NEMA-15), the NEMA power cord (227099-001) must be ordered separately. NOTE: If customers require a power cord, they can check the power cord matrix for the appropriate cord. Please see the following power cord matrix: http://www.hp.com/go/powercordmatrix
Advanced Power Management: Power Management Controller	In addition to the efficiencies gained by the shared power infrastructure, the DL2000 contains advanced power metering and capping capabilities. The embedded Power Management Controller (PMC) is able to monitor power consumption and throttle the speed of the processors and memory in each node within the chassis in order to maintain a pre-set power budget. HP provides a simple command-line utility, called HP ProLiant Power Interface Control (PPIC) Utility, for reading and configuring the power control logic of the server nodes. Versions are available for MS Windows Server OS (2008 and 2008 R2) and Linux OS (RHEL5 and SLES11) with the requirement that the OS IPMI Driver be installed. The following Power Management modes for power redundancy are standard and are configurable in the controller: • No Redundancy - power control disabled. No power throttling will occur. • (DEFAULT) AC Redundancy with Throttling. This mode allows all nodes to share both power supplies and run at maximum performance. Power control logic will only throttle the performance of each node when the power draw by the chassis attempts to exceed the load supported by the power supplies. In this mode, the box is expected to survive an unexpected AC Power loss to one of the power supplies. • Full AC/DC Redundancy - power control logic will maintain a power cap value for the chassis at the DC rating of a single power supply (750W, or 1200W), such that if one power supply experiences a DC or AC failure, the chassis should remain on-line and operational. Dynamic Power Capping is included with the LO100 Advanced Pack: • Dynamic Power Capping - User specifies the power envelope for the 2U chassis, within the capabilities of the hardware installed. Users run a utility to calibrate the minimum and maximum power consumption envelope for the chassis. In order to avoid any impact to performance due to throttling, a User selectable Power Cap value should not be set below the minimum power value

provided by the utility.

Power Supply	HP has a new design for ProLiant power supplies - the new Common Slot power supply bay. This design provides the customer with commonality in power supplies across multiple platforms to save on the cost of spares and allows HP to offer multiple power solutions to fit the customers' needs. Many HP ProLiant Servers come with high-efficiency Common Slot power supplies. The new HP Common Slot power supplies are designed for the highest power efficiency without degrading performance of the ProLiant server. These power supplies have efficiency ratings up to 94%. There are multiple power supply options available allowing you to "right-size" the most appropriate power supply for your server configuration. To make sure you select the correct power supply to meet your configuration, please use the HP Power Advisor at: www.hp.com/go/hppoweradvisor. All HP Common Slot power sources are UL, CE mark compliant, hot-plug, and support Redundant Power Management: In addition to the shared power and cooling infrastructure, the DL2000 contains advanced power metering and power capping technologies. The Power Interface Controller allows you to configure the system for full AC redundancy or AC redundancy with power throttling, depending on your configuration. With the optional Dynamic Power Capping mode, the DL2000 can boost the capacity of your data center by reclaiming trapped power and cooling capacity. HP offers several Common Slot Power Supply Options for this platform. NOTE: The 80 PLUS program is a unique forum that unites electric utilities, the computer industry, and consumers in an effort to bring energy efficient technology solutions to the marketplace. 80 Plus independently tests power supply efficiency and publicly posts the results on 80Plus.org. Optional power supplies can be purchased through power supply option kits (see Power Supply Options for part numbers). NOTE: Mixing of power supplies in the same chassis is not supported. All power supplies must be of the same type, all, 750W 94%, all 1200W 94%, or all 1200W 90%. If non-matched power supplies are inserted you will get errors and operation will fail.
System Fans	4 x 80mm system fans ship standard; Non-hot plug, Non-redundant.
Required Cabling	For required cabling information, refer to the HP Web site at: www.hp.com/servers/dl170e.
Operating Systems and Virtualization Software Support for ProLiant Servers	Microsoft Windows Server Red Hat Enterprise Linux (RHEL) SUSE Linux Enterprise Server (SLES) Oracle Solaris VMware ESX Citrix XenServer NOTE: For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server including how to purchase from HP, please visit our OS Support Matrix Site at: http://www.hp.com/go/ossupport and our driver download page www.hp.com/support/DL2000

Standard Features

Form Factor

HP ProLiant e2000 G6 Chassis - 2U Chassis can support up to four DL170e server nodes in the 2U chassis.

HP ProLiant DL170e G6 Server - Half-width system board. Half-height (1U) or full-height (2U) depending on riser option selected.

HP offers four different drive cages for the 2U HP ProLiant e2000 G6 Chassis

- 8 LFF HDD Cage
- 12 LFF HDD Cage
  NOTE: Available for special large volume configurations only. Contact HP representative)
- 16 SFF HDD Cage
- 24 SFF HDD Cage

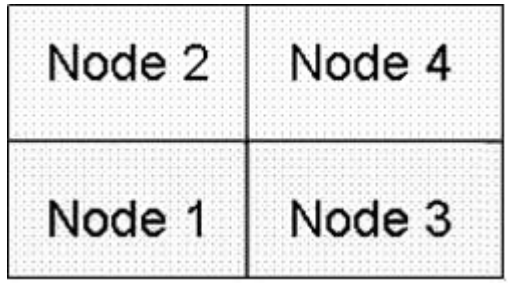
The 2U chassis can support two server node configurations:

- Two full height nodes
- Four half-height nodes

Server Node Blanks

If a server node is removed for a period, a blank must be installed to maintain the thermal environment in the chassis. It is okay to leave a node in the chassis powered off to be serviced in the future. But once a DL170e node is removed for servicing, a HP DL2000 Server Node Blank Kit is required. The blank is a 1U blank so two blanks are needed for a 2U node.

4 Node Configuration - Front View



NOTE: For 2 node configurations, 2U nodes are ordered and are numbered 1 and 3. NOTE: Additional nodes cannot be added later to 2 node configurations.

Standard Features

Embedded Manageability	HP ProLiant Lights-Out 100	HP Lights-Out 100 with Optional LO100 Advanced Licenses for Virtual KVM and Virtual Media. Standard Features: • IPMI 2.0, DCMI 1.0, and SMASH CLP support • Configuration via ROM Setup Utility or LO100cfg utility • USB 2.0 support for virtual media for much faster transfer speeds • Enhanced browser interface and embedded KVM over IP provides OS-independent remote graphical console • 24x7 Technical Support and Update (TSU) 1 year support and license upgrades included in Advanced license For more information, see: www.hp.com/go/lo100.
Security	Power-on password Setup password Diskette boot control Secure Sockets Layer (SSL) Secure Shell (SSH)	
Warranty	This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and repair is available for one year from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details. NOTE: Server Warranty includes 1 year Parts, 1 year Labor, 1-year on-site support with next business day response. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have HP replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at: http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html.	

Optional Features

HP Insight Control management software	HP Insight Control for Linux	HP Insight Control for Linux (IC-Linux), as a product option, delivers essential lifecycle management that can help save time and money by integrating discovery, server deployment, firmware updates & provisioning, health & performance management, remote management, and virtualization. This makes it easy to optimize your IT infrastructure through a single, simple management console. The IC-Linux suite installs and licenses software modules that are integrated into HP System Insight Manager (HP SIM). HP Insight Control for Linux serves environments requiring Linux-based management consoles. See www.hp.com/go/ic-linux. HP Insight Control for Linux includes one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, please visit: http://www.hp.com/services/insight.
	HP Insight Control server deployment	HP Insight Control server deployment is a deployment solution for HP ProLiant and Integrity servers hosted on a Windows CMS. It automates the process of deploying and provisioning server software, enabling companies to quickly and easily adapt to changing business demands. Insight Control server deployment includes software optimizations for HP servers, including the HP scripting toolkits, configuration jobs for leading industry-standard operating systems, sample unattended files, and HP server support packs that include software drivers, management agents, and important documentation. Deploying servers can be accomplished either through imaging or through scripting. Insight Control server deployment is hosted on a Windows server and is intended for heterogeneous environments deploying Windows, Linux, VMware ESX and Microsoft Hyper-V systems. Insight Control server deployment includes one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, please visit: http://www.hp.com/services/insight.

Optional Features

Core Server Management	ProLiant 100 Series G6 Core Management Software for ProLiant 100 Series Servers	HP provides management solutions that are designed to simplify a server's installation, configuration, and maintenance throughout the entire server lifecycle. This provides the customers with higher levels of operational efficiency and highly reliable systems. While ProLiant 100 series G6 servers do not support the Insight Foundation Suite for ProLiant, they support a key subset of this important suite software tools and utilities which are very suitable for this class of server: SIM, SMH, agents, providers, and a SmartStart 'like' deployment capability called Easy Set-up which greatly simplifies server set-up. Additionally the DL100 and SL100 G6 models support the SmartStart Scripting Toolkit (SSSTK), an automated scalable deployment utility. Information on core management supported on ProLiant 100 series G6 servers can be found at these URLS: ● Core Management: www.hp.com/go/coremanagement ● HP ProLiant 100 series Easy Set-up: www.hp.com/servers/easysetup
Core Infrastructure Management	HP Systems Insight Manager	HP Systems Insight Manager (HP SIM) provides a unified, secure and extensible standards-based environment to centrally manage servers, storage and other infrastructure devices, (both HP and non-HP) across multiple operating system platforms.
	Insight Management Agents	HP Insight Management Agents and Insight Management Providers are available for HP Systems Insight Manager (SIM) Integration. ProLiant 100-series G6 servers can use the same SNMP based Insight Management Agents supported by other ProLiant servers. As a result, administrators can use HP Systems Insight Manager (SIM) 5.3 and greater to manage ProLiant 100-series G6 servers. Administrators can also use any other SNMP- based management tool. These agents are obtained as part of the ProLiant 100-series model-specific "Easy Set-up" CDs, or through http://www.hp.com/servers/easysetup The following capabilities are enabled on the 100-series G6 servers by the SNMP agents: ● Health monitoring capabilities, including monitoring for drives, fans, network, power supplies, and temperature ● Alerting capabilities, including basic alert notification for Smart Array drive pre-failure only ● Performance monitoring capabilities providing information on processor, memory, disk free space, network utilization For additional information, please see: http://www.hp.com/go/insight
	Easy Set-up	Easy Set-up is available for this platform as an ISO image web download. HP ProLiant Easy Set-up provides easy, step-by-step, single and multi-server server utilities to streamline server setup. The user experience is consistent with SmartStart and offers the following capabilities:

	• Boot environment and GUI • Assisted Installation: Windows 2003 Server and Windows 2008 Server drivers • Manual installation: Windows 2003 Server, Windows 2008 Server, and Linux drivers (specific OS support varies by server. Refer to each server's QuickSpecs for supported versions) • HP Insight Diagnostics • AutoRun • Array Configuration Utility (ACU) has been combined with Array Diagnostics Utility (ADU) to offer both configuration of array controllers and storage devices and testing of array controller hardware • SmartStart Scripting Toolkit (SSSTK) and Smart Components for software and drivers NOTE: OS and SW available for Manual Installation are listed on each servers' QuickSpecs.
SmartStart Scripting Toolkit (SSSTK)	The SmartStart Scripting Toolkit is a server deployment product that delivers an unattended automated installation for high-volume server deployments. The SmartStart Scripting Toolkit includes a set of utilities for configuring and deploying servers in a customized, predictable, and unattended manner. These utilities enable you to duplicate the configuration of a source server on target servers with minimum user interaction. The Toolkit is designed for IT experts with experience in scripting operating system installations and configuring ProLiant server hardware. For additional information, please see: http://h18004.www1.hp.com/products/servers/management/toolkit/index.html
Subscriber's Choice	Subscriber's Choice Driver and Support Alerts/Notifications is a web-based email subscription service that provides software and driver change notifications for ProLiant products. Sign up at: http://www.hp.com/go/subscriberschoice and customize your profile to receive various new alerts as they become available, on a weekly or monthly basis.
ROMPaq, software and latest drivers	The latest software, drivers, and firmware fully optimized and tested for your ProLiant server and options; downloaded from Software and Drivers download pages website at: http://www.hp.com/go/support and from www.hp.com/servers/easysetup. Contains the following: • HP Insight Management Agents for Systems Insight Manager (SIM) Integration • HP Systems Management Homepage • Array Configuration Utility (ACU) • Array Diagnostics Utility (ADU) • HP Insight Diagnostics

Optional Features

High Performance Clusters	HP Cluster Platforms	HP Cluster Platforms are specifically engineered, factory-integrated large-scale ProLiant clusters optimized for High Performance Computing, with a choice of servers, networks and software. Operating system options include specially priced offerings for Red Hat Enterprise Linux and Novell SLES, as well as Microsoft Windows HPC Server. A Cluster Platform Configurator simplifies ordering. http://www.hp.com/go/clusters
	HP HPC Interconnects	High Performance Computing (HPC) interconnect technologies are available for this server as part of the HP Cluster Platform portfolio. These high-speed InfiniBand and Gigabit interconnects are fully supported by HP when integrated within an HP cluster. Flexible, validated solutions can be defined with the help of configuration tools. http://www.hp.com/techservers/clusters/ucp/index.html
	HP Cluster Management Utility	HP Cluster Management Utility (CMU) is an HP-licensed and HP-supported suite of tools that are used to manage large-scale Linux ProLiant systems. CMU includes software for the centralized provisioning, management and monitoring of nodes. CMU makes the administration of clusters user friendly, efficient, and effective. http://www.hp.com/go/cmu
	HP HPC Linux Value Pack	HP HPC Linux Value Pack (Value Pack) is an HP-licensed and HP-supported specially priced software bundle for the development and deployment of applications on HPC Cluster Platforms. Value Pack includes the Platform HPC Enterprise Edition suite of tools including the LSF workload scheduler, the HP-MPI parallelization library. Also included are the HP Unified Parallel C compiler and the HP Shmem library, as well as the execution environments for the libraries and compiler. HP HPC Linux Value Pack

Factory Express Portfolio for Servers and Storage

HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed.

Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant, HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSAxxxx, VA7xxx, EVA, XP, rackable tape libraries and configurable network switches.

For more information on Factory Express services for your specific server model please contact your sales representative or go to: http://www.hp.com/go/factory-express.

HP Enterprise Configurator

The HP eConfigure Enterprise Configurator now provides factory default racking for our HP hardware portfolio. This approach is aligned with our strategic direction to meet the needs and expectations of our valued customers. If you require "custom" rack configuration, please contact HP's Customer Business Center or an Authorized Partner for assistance. http://www.hp.com/products/configurator

Service and Support	**HP Technology Services for Industry Standard Servers and BladeSystem** Capitalizing on HP ProLiant server and HP BladeSystem capabilities requires a service partner who understands your increasingly complex business technology environment. That's why it makes sense to team up with the people who know HP infrastructure hardware and software best - the experienced professionals at HP Services. **What HP ProLiant and BladeSystem Services can do for you** HP ProLiant and BladeSystem Services can help you design, deploy, test, integrate, support, and manage IT and infrastructure solutions. This way, HP proposes services solutions that include more than just uplift of base warranty. You can get the support you need by choosing from one of a number of service packaged solutions we have designed to address wider set of customer support needs:. HP Technology Services meets business challenges with services offered in three packages - **Optimized Care Package, Standard Care Package, and Basic Care Package** - available for each product group. Such packaged solutions enable customers to optimize technology operations, minimize risk and drive better business outcomes with easy-to-buy, easy-to-use scalable support packages for servers, storage, networking and software.
Optimized Care	**Optimized Care Package: Supports maintaining servers at optimum performance availability** **HP ProLiant Server Hardware Installation** Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner. http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN **HP Installation and Startup for Insight Control Software** Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers. http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA0-9972ENW.pdf **3-Year HP Critical Advantage** Provides end-to-end infrastructure support solution for business critical applications running on virtualized/x86 infrastructures, enabling the customers to cost effectively build, operate, and continuously improve their IT environment. http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA3-1772ENW **Additional Services**: Microsoft or Linux or VMware education courses + Facility & technology environmental assessment services + Energy Efficiency Design, Factory Express

Service and Support

Standard Care	Standard Care Package: Package that maintains high level of server availability HP ProLiant Server Hardware Installation Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN HP Installation and Startup for Insight Control Software Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA0-9972ENW.pdf 3-Year HP 6 hour Hardware Support Onsite Call-to-Repair Service Provides an IT manager with a team of support specialists who will quickly begin troubleshooting the system to help return the hardware to operating condition within 6 hours of the initial service request to the HP Global Solution Center http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6636ENN 3-Year , HP 24x7 Software Support for Insight Control Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6645EEE.pdf Additional Services: Software OS (Microsoft, Linux (SUSE/Red Hat) & VMware Installation & Start Up, and Software Support; Install and Startup Services for Insight Control; Microsoft or Linux or VMware education courses; +30 Proactive Select Credits, Factory Express
Basic Care	Basic Care Package: delivers minimum recommended support service level HP ProLiant Server Hardware Installation Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN HP Installation and Startup for Insight Control Software Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA0-9972ENW.pdf 3-Year HP 24x7 4 hour Response, Hardware Support Onsite Service Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA0-9972ENW.pdf 3-Year , HP 24x7 Software Support for Insight Control Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6645EEE.pdf Additional Services: Software OS (Microsoft, Linux (SUSE/Red Hat) & VMware Installation & Start Up

	and Software Support); +10 Proactive Select Credits, Factory Express
Insight Remote Support	The packages include HP Insight Remote Support that uses proven technology to deliver secure, reliable 24x7 remote monitoring, diagnoses, and problem resolution. It is available at no additional cost to all warranty, HP Care Pack Service, and service agreement customers.
For more information	To learn more on HP ProLiant servers and HP BladeSystem servers, please contact your HP sales representative or HP Authorized Channel Partner. Or visit: http://www.hp.com/services/proliant

NOTE: This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for information on configurable product offerings and requirements.
NOTE: Configure-to-order (CTO) servers must start with a CTO Chassis.
NOTE: FIO indicates that this option is only available as a factory installable option.

Step 1: Base Configuration (choose one from each list unless otherwise noted)

HP Chassis	HP ProLiant e2000 G6 Configure-to-order Chassis	609326-B21
HP Drive Cage Options	HP 8LFF HDD Cage/Bkpln DL2000 FIO Kit	611431-B21
	HP 16SFF HDD Cage/Bkpln DL2000 FIO Kit	611433-B21
	HP 24SFF HDD Cage/Bkpln DL2000 FIO Kit	611434-B21
	NOTE: for configurations with the 12 LFF HDD Cage, please contact your HP representative.	
HP Rail Kits	HP ProLiant DL2000 2U rail kit NOTE: 2U rail kit used for HP or 3rd party racks - allows addition of one e2000 chassis at a time.	611428-B21
	HP ProLiant DL2000 10U Bulk rail kit NOTE: 10U rail kit used for HP racks ONLY - allows addition of five e2000 chassis at a time.	612901-B21
HP Drive Cage Cable Kits	NOTE: Required Drive Cage Cable kits for the DL2000. These cables connect the midplane to the drive backplane and are based on the drive cage used and the number of nodes.	
	2 Node 8LFF Configurations - order the following cables to connect the midplane to the drive backplane:	
	HP Mini-SAS-2 SATA 20/25/29cm E FIO NOTE: Quantiity 1 per chassis.	612256-B21
	HP Mini-SAS-2 SATA 25/20/29cm F FIO NOTE: Quantiity 1 per chassis.	612257-B21
	2 Node 16SFF Configurations - order the following cables to connect the midplane to the drive backplane:	
	HP Mini-SAS to Mini-SAS 25cm B FIO NOTE: Quantity 1 per chassis.	612254-B21
	HP Mini-SAS to Mini-SAS 33cm C FIO NOTE: Quantity 2 per chassis.	612255-B21
	HP Mini-SAS to Mini-SAS 45cm D FIO NOTE: Quantity 1 per chassis.	625805-B21
	2 Node 24 SFF Configurations - order the following cables to connect the midplane to the drive backplane:	
	HP Mini-SAS to Mini-SAS 25cm B FIO NOTE: Quantity 4 per chassis.	612254-B21
	HP Mini-SAS to Mini-SAS 33cm C FIO NOTE: Quantity 3 per chassis.	612255-B21
	HP Mini-SAS to Mini-SAS 45cm D FIO NOTE: Quantity 1 per chassis.	625805-B21
	4 Node 8LFF Configurations - order the following cables to connect the midplane to the drive backplane:	

	HP Mini-SAS to SAS/SATA E' FIO NOTE: Quantity 2 per chassis.	630870-B21
	HP Mini-SAS to SAS/SATA F' FIO NOTE: Quantity 2 per chassis.	630872-B21
	4 Node 16SFF Configurations - order the following cables to connect the midplane to the drive backplane:	
	HP Mini-SAS to Mini-SAS 25cm B FIO NOTE: Quantity 1 per chassis.	612254-B21
	HP Mini-SAS to Mini-SAS 33cm C FIO NOTE: Quantity 3 per chassis.	612255-B21
	4 Node 24 SFF Configurations - order the following cables to connect the midplane to the drive backplane:	
	HP Mini-SAS to Mini-SAS 25cm B FIO NOTE: Quantity 4 per chassis.	612254-B21
	HP Mini-SAS to Mini-SAS 33cm C FIO NOTE: Quantity 3 per chassis.	612255-B21
	HP Mini-SAS to Mini-SAS 45cm D FIO NOTE: Quantity 1 per chassis.	625805-B21
HP Power Supplies	NOTE: Prior to making a power supply selection it is highly recommended that the HP Power Advisor is run to determine the right size power supply for your server configuration. The HP Power Advisor is located at: www.hp.com/go/hppoweradvisor	
	HP 750W Common Slot Platinum Hot Plug Power Supply Kit	593831-B21
	HP 1200W Common Slot Platinum Hot Plug Power Supply Kit	578322-B21
	HP 1200W Common Slot Silver Hot Plug Power Supply Kit	500172-B21

Step 1A: Choose Required Nodes (Must select either a 4-Node or 2-Node solution)

HP Nodes	HP ProLiant DL170e G6 Node 1U Configure-to-order Server NOTE: Must select quantity 4 of P/N: 609095-B21 for 4-Node Solution.	609095-B21
	HP ProLiant DL170e G6 Node 2U Configure-to-order Server NOTE: Must select quantity 2 of P/N: 609096-B21 for 2-Node Solution.	609096-B21

Step 2: Choose Required Node Options (only one of the following from each list unless otherwise noted)

HP Processors	NOTE: If 2 processors are desired, select one xxxxxx-L21 and one xxxxxx-B21	
	Six-Core Processors	
	HP DL170e G6 Intel® Xeon® X5675 (3.06GHz/6-core/12MB/95W) FIO Processor Kit	638021-L21
	HP DL170e G6 Intel® Xeon® X5670 (2.93GHz/6-core/12MB/95W) FIO Processor Kit	612470-L21
	HP DL170e G6 Intel® Xeon® X5660 (2.80GHz/6-core/12MB/95W) FIO Processor Kit	609142-L21
	HP DL170e G6 Intel® Xeon® X5650 (2.66GHz/6-core/12MB/95W) FIO Processor Kit	609140-L21

	HP DL170e G6 Intel® Xeon® E5649 (2.53GHz/6-core/12MB/80W) FIO Processor Kit	638019-L21
	HP DL170e G6 Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W) FIO Processor Kit	638017-L21
	HP DL170e G6 Intel® Xeon® L5640 (2.26GHz/6-core/12MB/60W) FIO Processor Kit	609132-L21
	Four-Core Processors	
	HP DL170e G6 Intel® Xeon® E5640 (2.66GHz/4-core/12MB/80W) FIO Processor Kit	612466-L21
	HP DL170e G6 Intel® Xeon® E5630 (2.53GHz/4-core/12MB/80W) FIO Processor Kit	609138-L21
	HP DL170e G6 Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W) FIO Processor Kit	609136-L21
	HP DL170e G6 Intel® Xeon® L5630 (2.13GHz/4-core/12MB/40W) FIO Processor Kit	612468-L21
	HP SL160s G6 Intel® Xeon® E5607 (2.26GHz/4-core/8MB/80W) FIO Processor Kit	638015-L21
	HP DL170e G6 Intel® Xeon® E5603 (1.60GHz/4-core/4MB/80W) FIO Processor Kit	638013-L21
HP Memory	Registered DIMMs (RDIMMs)	
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
	HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
	HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
	HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit NOTE: Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.	604504-B21
	HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500662-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit NOTE: Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.	604506-B21
	Unbuffered with ECC DIMMs (UDIMMs) NOTE: Maximum 12 DIMMs supported per node.	
	HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500668-B21
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-B21

	HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500672-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3L-10600 (DDR3-1333) Unbuffered CAS-9 Low Power Memory Kit	619488-B21

NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator.
NOTE: Kits described as LV include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient
NOTE: PC3L is a low voltage memory.

NOTE: There is a maximum support limitation of 8 ranks per memory channel (maximum of 2 quad rank DIMMs per channel)
NOTE: Memory Min and Max depends on number of processors and type of memory:

1. Processor -> R-Dimm: Min 1 // Max 8 U-Dimm: Min 1 // Max 6
2. Processors -> R-Dimm: Min 2 // Max 16 U-Dimm: Min 2 // Max 12

HP I/O Expansion Options	Full-height (Only required if PN: 609096-B21 is selected in Step 1A above)	
	HP DL170h I/O Riser PCIe x16 x4 x4 FIO	514005-B21
	HP DL170h I/O Riser PCIe x8 x8 x8 FIO	503587-B21
	HP DL170h I/O Riser PCIe x16 x8 FIO	512481-B21

NOTE: The 2 slot riser (P/N: 512481-B21) is the only riser option that supports the NVIDIA graphics cards.

Step 3: Choose Additional Factory Integratable Options (only one of the following from each list unless otherwise noted)

HP Storage Controllers

NOTE: Non-Hot-Plug SATA Models: The embedded HP Smart Array B110i SATA RAID supports RAID 0,1,10 and cold-plug capability with hot-plug form factor drives. Non-hot-plug form factor hard disk drives are not supported in the DL2000.
NOTE: Hot-Plug SATA Models: A HP Smart Array B110i SATA RAID Hot-Plug Advanced Pack per server or virtual machine is required for hot-plug SATA using the embedded B110i SATA RAID controller.
NOTE: Supported controllers vary by configuration. See table below for supported controllers. For a complete list of HP Storage controllers, please see the Additional Options section of this QuickSpecs. Only FIO options are mentioned here.

Configuration Information - Factory Integrated Models

Configuration	Supported Controllers
4x1U nodes with 8LFF HDD cage (2 HDDs/node max)	Embedded (SATA only) or P410 (SATA/SAS)
4x1U nodes with 16SFF HDD cage (4 HDDs/node max)	Embedded (SATA only) or P212 or P410 (SATA/SAS)
4x1U nodes with 24SFF HDD cage (6 HDDs/node max)	Embedded (SATA only) or P410 (SATA/SAS)
2x2U nodes with 8LFF HDD cage (4 HDDs/node max)	Embedded (SATA only) or P212, P410 or P812 (SATA/SAS)
2x2U nodes with 16SFF HDD cage (8 HDDs/node max)	P410 or P812 (SATA/SAS)
2x2U nodes with 24SFF HDD cage (12 HDDs/node max)	P410 or P812 (SATA/SAS) and SAS Expander

HP Smart Array P410/ZM 2-ports Int PCIe x8 FIO SAS Controller 462860-B21

Controller Cable Kits

NOTE: Required Controller Cables for the DL2000. The Controller Cables below connect to the adapter board and is based on the controller used. (If using a configurator, these cable kits will automatically be included based on controller selection.) For a complete list of HP Controller Cable Kits, please see the Additional Options section of this QuickSpecs. Only FIO options are mentioned here.

HP DL170e G6 Embedded Controller Cable Kit 612205-B21

NOTE: Supports SATA drives only using embedded SATA controller.

Step 4: Choose Additional Options for Factory Integration

NOTE: For additional options, please refer to the "Core Options" and "Additional Options" section below.

Core Options

NOTE: Some options may not be integrated at the factory. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

HP Unique Options	HP DL170h Dedicated Management Port OPT Kit NOTE: Each ProLiant DL170e G6 Server comes standard with sideband support for LO100i through the shared, system NIC. Order this option (P/N 601818-B21) if a dedicated management network is desired.	601818-B21
	HP DL2000 Server Node Blank Kit NOTE: This blank kit is required to replace a server node when servicing it to maintain the thermal envelope of the system.	612898-B21
	HP DL170e G6 Smart Array P410 Controller Cable Kit NOTE: This cable kit is only required when upgrading with a Smart Array P410 Controller after initial purchase. NOTE: Supports SAS and SATA drives when using Smart Array P410 Controller.	612206-B21
	HP DL170e G6 Smart Array Controller Cable Kit NOTE: This cable kit is only required when upgrading with any Smart Array Controller other than the P410 after initial purchase. NOTE: Supports SAS and SATA drives when using any Smart Array Controller other than the Smart Array P410 Controller.	612207-B21
	HP DL170e G6 GPU Adapter Kit NOTE: This kit is required when installing a NVIDIA card in the DL170e 2U server node.	612253-B21
	HP DL2000 Shipping Bracket Kit NOTE: This kit is required after initial purchase when shipping a DL2000 in a rack with 1U or more of space above it from one location to another.	626167-B21

HP Processors	Six-Core Processors	
	HP DL170e G6 Intel® Xeon® X5675 (3.06GHz/6-core/12MB/95W) Processor Kit	638021-B21
	HP DL170e G6 Intel® Xeon® X5670 (2.93GHz/6-core/12MB/95W) Processor Kit	612470-B21
	HP DL170e G6 Intel® Xeon® X5660 (2.80GHz/6-core/12MB/95W) Processor Kit	609142-B21
	HP DL170e G6 Intel® Xeon® X5650 (2.66GHz/6-core/12MB/95W) Processor Kit	609140-B21
	HP DL170e G6 Intel® Xeon® E5649 (2.53GHz/6-core/12MB/80W) Processor Kit	638019-B21
	HP DL170e G6 Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W) Processor Kit	638017-B21
	HP DL170e G6 Intel® Xeon® L5640 (2.26GHz/6-core/12MB/60W) Processor Kit	609132-B21
	Four-Core Processors	
	HP DL170e G6 Intel® Xeon® E5640 (2.66GHz/4-core/12MB/80W) Processor Kit	612466-B21
	HP DL170e G6 Intel® Xeon® E5630 (2.53GHz/4-core/12MB/80W) Processor Kit	609138-B21
	HP DL170e G6 Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W) Processor Kit	609136-B21
	HP DL170e G6 Intel® Xeon® L5630 (2.13GHz/4-core/12MB/40W) Processor Kit	612468-B21
	HP DL170e G6 Intel® Xeon® E5607 (2.26GHz/4-core/8MB/80W) Processor Kit	638015-B21
	HP DL170e G6 Intel® Xeon® E5603 (1.60GHz/4-core/4MB/80W) Processor Kit	638013-B21
	HP DL170e G6 Intel® Xeon® E5506 (2.13GHz/4-core/4MB/80W) Processor Kit	612464-B21

Core Options

HP Memory	Registered DIMMs (RDIMMs)	
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
	HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
	HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
	HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit NOTE: Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.	604504-B21
	HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500662-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit NOTE: Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.	604506-B21
	Unbuffered with ECC DIMMs (UDIMMs) NOTE: Maximum 12 DIMMs supported per node.	
	HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500668-B21
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500672-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3L-10600 (DDR3-1333) Unbuffered CAS-9 Low Power Memory Kit	619488-B21
	NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator. NOTE: Kits described as LV include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient NOTE: PC3L is a low voltage memory. NOTE: Memory DIMM blanks are required in any empty DIMM slots for proper cooling. If DIMMs are removed or the memory configuration is changed, all DIMM slots must be populated with either a blank or a DIMM. NOTE: There is a maximum support limitation of 8 ranks per memory channel (maximum of 2 quad rank DIMMs per channel) NOTE: Memory Min and Max depends on number of processors and type of memory: 1. Processor -> R-Dimm: Min 1 // Max 8 U-Dimm: Min 1 // Max 6 2. Processors -> R-Dimm: Min 2 // Max 16 U-Dimm: Min 2 // Max 12	

HP Hard Drives	NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or	

the system bandwidth will be negotiated down to an acceptable level for all components.

NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives	
HP 900GB 6G SAS 10K rpm SFF (2.5-inch) Enterprise 3yr Warranty Hard Drive	619291-B21
HP 600GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581286-B21
HP 450GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581284-B21
HP 300GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507127-B21
HP 146GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512547-B21
HP 146GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507125-B21
HP 72GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512545-B21
SAS Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives	
HP 600GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516828-B21
HP 450GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516816-B21
HP 300GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516814-B21
SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives	
HP 1TB 6G SAS 7.2K rpm SFF (2.5-inch) Hot Plug Midline 1yr Warranty Hard Drive	605835-B21
HP 500GB 6G SAS 7.2K rpm SFF (2.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507610-B21
SAS Hot Plug LFF (3.5-inch) Midline (MDL) Drives	
HP 2TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507616-B21
HP 1TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507614-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/12244_na/12244_na.html

SATA Hot Plug SFF (2.5-inch) Midline (MDL) Drives	
HP 1TB 3G SATA 7.2K rpm SFF (2.5-inch) Hot Plug Midline 1yr Warranty Hard Drive	625609-B21
HP 500GB 3G SATA 7.2K rpm SFF (2.5-inch) Midline 1yr Warranty Hard Drive	507750-B21
HP 160GB 3G SATA 7.2K rpm SFF (2.5-inch) Midline 1yr Warranty Hard Drive	530888-B21
SATA Hot Plug LFF (3.5-inch) Midline (MDL) Drives	
HP 2TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	507632-B21
HP 1TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	454146-B21
HP 500GB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	458928-B21

Core Options

	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13021_na/13021_na.html	
	SATA Hot Plug Midline (MDL) Solid State Drives	
	HP 60GB 3G SATA SFF (2.5-inch) Midline 1yr Warranty Solid State Drive	572071-B21
	HP 120GB 3G SATA SFF (2.5-inch) Midline 1yr Warranty Solid State Drive	572073-B21
	SATA Hot Plug 3.5" Midline (MDL) Solid State Drives	
	HP 60GB 3G SATA LFF (3.5-inch) Midline 1yr Warranty Solid State Drive	570761-B21
	HP 120GB 3G SATA LFF (3.5-inch) Midline 1yr Warranty Solid State Drive	570763-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13415_na/13415_na.html	
HP Networking	Gigabit Ethernet adapters	
	HP NC112T PCIe Gigabit Server Adapter	503746-B21
	HP NC360T PCI Express Dual Port Gigabit Server Adapter	412648-B21
	HP NC364T PCI Express Quad Port Gigabit Server Adapter	435508-B21
	HP NC365T 4-port Ethernet Server Adapter	593722-B21
	HP NC373F PCI Express Multifunction Gigabit Server Adapter	394793-B21
	HP NC373T PCI Express Multifunction Gigabit Server Adapter	394791-B21
	HP NC375T PCI Express Quad Port Gigabit Server Adapter	538696-B21
	HP NC382T PCI Express Dual Port Multifunction Gigabit Server Adapter	458492-B21
	10 Gigabit Ethernet Adapters NOTE: No more than two 10GbE I/O devices are supported in a single ProLiant server. NOTE: A minimum of two Gigabytes (2 GB) of server memory is required per each adapter. NOTE: Direct Attach Cable (DAC) for copper environments or fiber transceivers and cables for fiber-optic environments must be purchased separately.	
	HP NC550SFP Dual Port 10GbE Server Adapter	581201-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: www.hp.com/go/ProLiantNICs.	
HP InfiniBand	HP IB 4X QDR CX-2 PCI-e G2 Dual Port HCA	592520-B21
	HP IB 4X DDR CX-2 PCI-e G2 Dual Port HCA	592521-B21
	QLogic 4X QDR IB PCI-e G2 HCA	583211-B21
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/13078_na/13078_na.html	

Core Options

HP Power Supplies	NOTE: Prior to making a power supply selection it is highly recommended that the HP Power Advisor is run to determine the right size power supply for your server configuration. The HP Power Advisor is located at: www.hp.com/go/hppoweradvisor	
	HP 1200W Common Slot Platinum Hot Plug Power Supply Kit	578322-B21
	HP 1200W Common Slot Silver Hot Plug Power Supply Kit	500172-B21
	HP 750W Common Slot Platinum Hot Plug Power Supply Kit	593831-B21
	NOTE: Option Kits contain optional power supply, an IEC power cable and PDU IEC cables.	

NOTE: Some options may not be integrated at the factory. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

High Performance Clusters	**HP Cluster Management Utility**	
	HP Cluster Management Utility Compute Node Flexible License NOTE: This part number can be used to purchase one certificate for multiple licenses with a single activation key. Each license is for one node (server). Customer will receive a printed end user license agreement and license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online in order to obtain a license key.	QL803A
	HP Cluster Management Utility License and Media NOTE: Order a minimum of one license per cluster to purchase media including software and documentation, which will be delivered to the customer, and also licenses CMU management. No license key is delivered or required. NOTE: For additional license kits please see the QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/12612_na/12612_na.html	433257-B21
	HP HPC Linux Value Pack	
	HP High Performance Computing Linux Value Pack 1 Processor Flexible License NOTE: This part number can be used to purchase one certificate for multiple licenses with a single activation key. Each license is for one socket (a.k.a. processor). Customer will receive a printed end user license agreement and license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online in order to obtain a license key.	TC293B
	HP High Performance Computing Linux Value Pack Media Kit NOTE: This part number can be used to purchase media including software and documentation, which will be delivered to the customer. NOTE: For additional license kits please see the QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/13485_na/13485_na.html	TC294A
HP Security - TPM	HP Trusted Platform Module Option Kit NOTE: The TPM (Trusted Platform Module) is a microcontroller chip that can securely store artifacts used to authenticate the server platform. These artifacts can include passwords, certificates and encryption keys. Windows® BitLocker™ Drive Encryption (BitLocker) is a data protection feature available in Windows Server® 2008. BitLocker leverages the enhanced security capabilities of a Trusted Platform Module (TPM) version 1.2. The TPM works with BitLocker to help protect user data and to ensure that a server running Windows Server 2008 has not been tampered with while the system was offline. For more information about TPM, including a white paper, go to: www.hp.com/go/TPM. NOTE: ProLiant OS pre-installed units will come with the partition required for TPM deployment. NOTE: The TPM key is unique to every TPM deployed server and must be retained. Misplacing or losing the key could result in data loss.	488069-B21
HP Storage Controllers	**HP Smart Array P212 Controller**	
	HP Smart Array P212/256 1-ports Int/1-ports Ext PCIe x8 SAS Controller	462834-B21
	HP Smart Array P212/ZM 1-ports Int/1-ports Ext PCIe x8 SAS Controller	462828-B21

Additional Options

HP Smart Array P410 Controller	
HP Smart Array P410/256 2-ports Int PCIe x8 SAS Controller	462862-B21
HP Smart Array P410/512 FBWC 2-ports Int PCIe x8 SAS Controller	578230-B21
HP Smart Array P410/1G FBWC 2-ports Int PCIe x8 SAS Controller	572532-B21
HP Smart Array P411 Controller	
HP Smart Array P411/256 2-ports Ext PCIe x8 SAS Controller	462830-B21
HP Smart Array P411/512 FBWC 2-ports Ext PCIe x8 SAS Controller	578229-B21
HP Smart Array P411/1G FBWC 2-ports Ext PCIe x8 SAS Controller	572531-B21
Smart Array P812 Controller	
HP Smart Array P812/1G FBWC 2-ports Int/4-ports Ext PCIe x8 SAS Controller	487204-B21
Optional Upgrades	
HP DL170e G6 Smart Array P410 Controller Cable Kit NOTE: This cable kit is only required when upgrading with a Smart Array P410 Controller after initial purchase. NOTE: Supports SAS and SATA drives when using Smart Array P410 Controller.	612206-B21
HP DL170e G6 Smart Array Controller Cable Kit NOTE: This cable kit is only required when upgrading with any Smart Array Controller other than the P410 after initial purchase. NOTE: Supports SAS and SATA drives when using any Smart Array Controller other than the Smart Array P410 Controller.	612207-B21
HP 256MB P-series Cache Upgrade NOTE: Supported on HP Smart Array P212 Controller only.	462968-B21
HP 512MB Flash Backed Write Cache	534916-B21
HP 1GB Flash Backed Cache	534562-B21
HP Smart Array Hot Plug Advance Pack for B110i w/1y 24x7 Supp Physical 1 Svr LTU	TC421A
NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13203_na/13203_na.html (Smart Array P212 Controller) http://h18000.www1.hp.com/products/quickspecs/13201_na/13201_na.html (Smart Array P410 Controller) http://h18000.www1.hp.com/products/quickspecs/13202_na/13202_na.html (Smart Array P411 Controller) http://h18000.www1.hp.com/products/quickspecs/13558_na/13558_na.html (Smart Array P812 Controller)	
SAS Controller Options	
HP 24 Bay 3Gb SAS Expander Card	468406-B21
NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18004.www1.hp.com/products/quickspecs/13232_na/13232_na.html (SAS Expander Card)	
SCSI HBA	
HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter	412911-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/12566_na/12566_na.html
(SCSI HBA)

HP StorageWorks Options	StorageWorks Fibre Channel HBA	
	NOTE: The following is a list of all Fibre Channel Host Bus Adapters for Windows and Linux. For detailed compatibility information please see: http://h18006.www1.hp.com/storage/saninfrastructure/hba.html	
	Brocade Fibre Channel HBAs	
	HP StorageWorks 81B PCIe 8Gb Fibre Channel Single Port Host Bus Adapter	AP769A
	HP StorageWorks 82B PCIe 8Gb Fibre Channel Dual Port Host Bus Adapter	AP770A
	HP StorageWorks 41B PCIe 4Gb Fibre Channel Single Port Host Bus Adapter	AP767A
	HP StorageWorks 42B PCIe 4Gb Fibre Channel Dual Port Host Bus Adapter	AP768A
	Emulex Fibre Channel HBAs	
	HP StorageWorks 81E 8Gb Single Port PCI-e Fibre Channel Host Bus Adapter	AJ762A
	HP StorageWorks 82E 8Gb Dual Port PCI-e Fibre Channel Host Bus Adapter	AJ763A
	HP StorageWorks FC2142SR 4Gb PCIe Host Bus Adapter	A8002A
	HP StorageWorks FC2242SR 4Gb PCIe DC Host Bus Adapter	A8003A
	QLogic Fibre Channel HBAs	
	HP StorageWorks 81Q PCI-e Fibre Channel Host Bus Adapter	AK344A
	HP StorageWorks 82Q 8Gb Dual Port PCI-e Fibre Channel Host Bus Adapter	AJ764A
	HP StorageWorks FC1142SR 4Gb PCIe Host Bus Adapter	AE311A
	HP StorageWorks FC1242SR 4Gb PCIe DC Host Bus Adapter	AE312A
	StorageWorks SCSI HBA	
	HP StorageWorks U320e SCSI Dual Channel Host Bus Adapter	AH627A
	NOTE: Recommended Dual Channel Ultra320 SCSI Controller for connecting multi-drive MSL tape libraries to ProLiant servers.	
	StorageWorks Converged Network Adapter	
	HP StorageWorks CN1000E Dual Port Converged Network Adapter	AW520A

Additional Options

HP Rack Options	HP DL2000 Shipping Bracket Kit	626167-B21
	NOTE: This kit is required after initial purchase when shipping a DL2000 in a rack with 1U or more of space above it from one location to another.	
	HP Rail Kits	
	HP 10U Bulk Rail 2U Kit	612901-B21
	HP DL2000 Hardware Rail Kit	611428-B21

NOTE: The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. The 10000 Series Racks provide enhanced airflow for maximum cooling, allowing these racks to be fully loaded with servers using the latest processors.

CAUTION: If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment: Front and rear doors: If your 42U server rack includes closing front and rear doors, you must allow 830 square inches (5,350 sq cm) of hole evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation). Side: The clearance between the installed rack component and the side panels of the rack must be a minimum of 2.75 inches (7 cm).

CAUTION: Always use blanking panels to fill all remaining empty front panel U-spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.

NOTE: Quick deploy rail system provides tool-free support for racks with square or round mounting holes (including Compaq/HP 7000, 9000, 10000 G2 and HP series), with an adjustment range of 24" - 36". The ambidextrous cable management arm can be mounted on either the left or right side for improved cable management.

NOTE: The HP ProLiant DL2000 has two different rail kits to choose from:

- 10U bulk rail kit - Use this kit for installing multiple DL2000's in HP 10000 series racks. If buying multiple DL2000's, this bulk rail will save installation time and money over the individual 2U rail kit.
  - One 10U bulk rail kit will hold up to five e2000 chassis, thus up to twenty DL170e G6 server nodes
- 2U rail kit - Use this kit for installing in 3rd party racks or to install one e2000 chassis at a time
  - One 2U rail kit will hold one e2000 chassis, thus up to four DL170e servers
- Additionally, the DL2000 has a HP Rack Rail Shipping Bracket Kit that must be used any time the e2000 G6 chassis is shipped in a rack without any items directly above it. For additional information, please visit: www.hp.com/go/rackandpower.

Memory

HP ProLiant DL170e G6 Server

NOTE: Memory configurations show Maximum Memory population.

Maximum Memory

Up to 192GB, using PC3-8500R DDR3 Registered (RDIMM) memory, operating at 800MHz when fully populated at 2 DIMMs per Channel in 12 slots

Up to 48GB, using PC3-10600E DDR3 Unbuffered (UDIMM) memory, operating at 1333MHz when fully populated at 2 DIMMs per Channel in 12 slots

NOTE: RDIMMs and UDIMMs cannot be in the same system so the maximum RDIMM memory configuration can only be achieved with BTO models by replacing all of the UDIMMs.

NOTE: Chart does not represent all possible memory configurations.

DDR3 memory population guidelines

For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator

- Some DIMM installation guidelines are summarized below:
- Memory DIMM blanks are required in any empty DIMM slots for proper cooling. If DIMMs are removed or the memory configuration is changed, all DIMM slots must be populated with either a blank or a DIMM.
- For servers with sixteen (16) memory slots
- There are three (3) channels per processor; six (6) channels per server
- There are two (3) DIMM slots for two memory channels and one (2) DIMM slots for one memory channel; sixteen (16) total slots
- Memory channel 1 consists of the two (2) DIMM slots that are closest to the processor
- Memory channels 2 and 3 consist of the six (6) DIMM slots that are furthest from the processor
- DIMM slots that are white should be populated first
- Do not mix Unbuffered memory (UDIMMs) with Registered memory (RDIMMs)
- Do not install DIMMs if the corresponding processor is not installed
- If only one processor is installed in a 2CPU system, only half of the DIMM slots are available
- To maximize performance, balance the total memory capacity between all installed processors
- It is not required, but it is recommended to load the channels similarly if possible
- You can only have up to eight (8) ranks installed per channel
- You can only install two quad-rank DIMMs per channel
- You can only install two UDIMMs per channel; if available, the third slot in the channel must remain empty
- Populate DIMMs from heaviest load (quad-rank) to lightest load (single-rank) within a channel
- Heaviest load (DIMM with most ranks) within a channel goes furthest from the chipset
- Low Voltage DIMMs can only be used with Intel Xeon 5600 series processors.
- For memory mirroring mode, channel 3 must be unpopulated. Channels 1 and 2 are populated identically
- For lock-step mode, channel 3 must be unpopulated. DIMMs in channels 1 and 2 will be installed in pairs. The paired slots will be 1,4; 2,5; 3;6 on a 3DPC system or 1,4; 2,5; on a 2DPC system
- If mixing DIMM voltage is a requirement, please note that the DIMMs will run at 1.5V since all 1.35V are capable of supporting 1.5V operations.

Memory

DIMM Type ->	Registered DIMMs (RDIMMs)								Unbuffered with ECC DIMMs (UDIMMs)		
DIMM Rank ->	Single Rank (1R)	Dual Rank (2R)					Quad Rank (4R)		Single Rank (1R)	Dual Rank (2R)	
DIMM Capacity ->	4GB	2GB	4GB	8GB	8GB	16GB	4GB	16GB	1GB	2GB	4GB
DIMM Native Speed (MHz) ->	1333	1333	1333	1066	1333	1333	1066	1066	1333	1333	1333
Voltage	LV/Std	Std	Std	Std	LV/Std	LV/Std	Std	Std	Std	Std	LV/Std
SLOTS THAT CAN BE POPULATED											
16 slot servers	16	16	16	16	16	16	12	12	12	12	12
MAXIMUM MEMORY CAPACITY (GB)											
16 slot servers	64	32	64	128	128	256	48	192	12	24	48
POPULATED DIMM SPEED (MHz)											
1 DIMM Per Channel	1333	1333	1333	1066	1333	1333	1066	1066	1333	1333	1333
2 DIMMs Per Channel	1333*	1333*	1333*	1066	1333*	1066/ 1333**	800	800	1066	1066	1333*
3 DIMMs Per Channel (on 2 channels)	800	800	800	800	800	800***	N/A	N/A	N/A	N/A	N/A

*supported with ROM update via ROM Based Setup Utility (RBSU)
** 2DPC: LV runs at 1066, Std voltage runs at 1333
***3DPC: LV/Std voltage runs at 800

NOTES:

- PC3-10600 DIMMs have a maximum speed of 1333MHz. PC3-8500 DIMMs have a maximum speed of 1066MHz
- Mixing DIMM speeds is allowed, but the system processor speed rules always override the DIMM capabilities
- If you do mix DIMM speeds, the memory bus will default to the minimum clock rate of all DIMMs in the system - even if the slower DIMM is on the other processor
- If you install 1x 1066MHz DIMM in channel 1 and 1x 1333MHz DIMM in channel 2, the maximum speed will be 1066MHz If you install 1x 1066MHz DIMM in channel 1 and 5x 1333MHz DIMMs with 1 DIMM Per Channel (DPC) in each of the other channels, the maximum speed will be 1066MHz
- If you install 3DPC in one channel (if applicable) and 1DPC in all other channels, you run at 800MHz
- Maximum memory speed will also depend on the processor installed
- References to the above MHz speeds are for the various speeds of DDR3 DIMMs; 1333 refers to DDR3-1333, etc.

DIMM slot and configuration diagrams
Basic memory slot & population diagram

- Population order; start with "A" first, "B" second, "C" third, etc. DIMM 8 is DIMM furthest away from the CPU and DIMM 1 is DIMM closest to CPU.

Memory

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A	1	A	Chnl 1
	2	D	2	D	
	3	G	3	G	
Chnl 2	4	B	4	B	Chnl 2
	5	E	5	E	
	6	H	6	H	
Chnl 3	7	C	7	C	Chnl 3
	8	F	8	F	

RDIMM maximum configuration (2 CPUs)

- 192GB, consisting of sixteen (16) 16GB quad rank PC3-8500 RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A; 16GB DIMM	1	A; 16GB DIMM	Chnl 1
	2	D; 16GB DIMM	2	D; 16GB DIMM	
	3	G; empty	3	G; empty	
Chnl 2	4	B; 16GB DIMM	4	B; 16GB DIMM	Chnl 2
	5	E; 16GB DIMM	5	E; 16GB DIMM	
	6	H; empty	6	H; empty	
Chnl 3	7	C; 16GB DIMM	7	C; 16GB DIMM	Chnl 3
	8	F; 16GB DIMM	8	F; 16GB DIMM	

UDIMM maximum configuration (2 CPUs)

- 48GB, consisting of twelve (12) 2GB dual-rank PC3-10600 UDIMMs

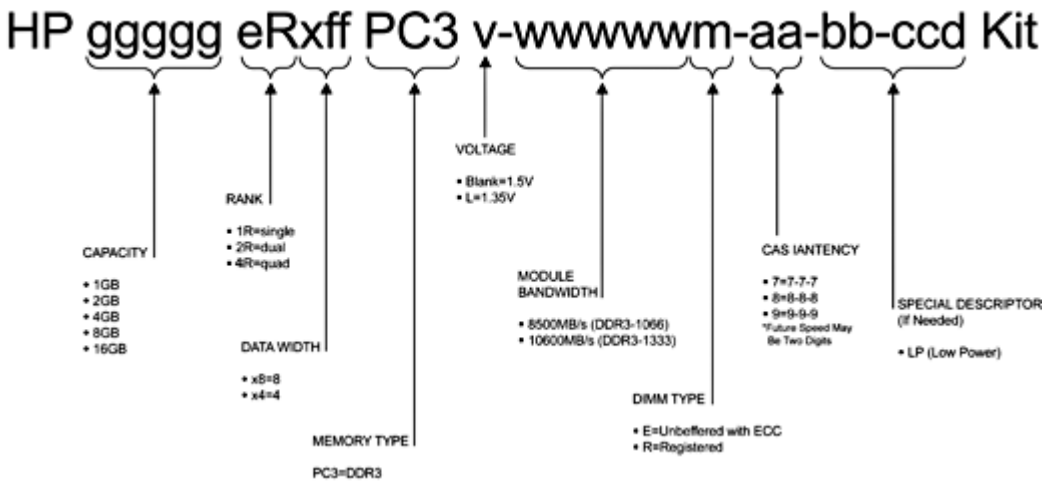
	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A; 4GB DIMM	1	A; 4GB DIMM	Chnl 1
	2	D; 4GB DIMM	2	D; 4GB DIMM	
	3	G; empty	3	G; empty	
Chnl 2	4	B; 4GB DIMM	4	B; 4GB DIMM	Chnl 2
	5	E; 4GB DIMM	5	E; 4GB DIMM	
	6	H; empty	6	H; empty	
Chnl 3	7	C; 4GB DIMM	7	C; 4GB DIMM	Chnl 3
	8	F; 4GB DIMM	8	F; 4GB DIMM	

Memory

NOTE: Capacity references are rounded to the common Gigabyte values.

- 1GB = 1024MB
- 2GB = 2048MB
- 4GB = 4096MB
- 8GB = 8192MB
- 16GB = 16384MB

DDR3 memory options part number decoder



Following are memory options available from HP:

HP Memory	Registered DIMMs (RDIMMs)	
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
	HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
	HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
	HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit NOTE: Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.	604504-B21
	HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500662-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit NOTE: Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.	604506-B21
	Unbuffered with ECC DIMMs (UDIMMs) NOTE: Maximum 12 DIMMs supported per node.	

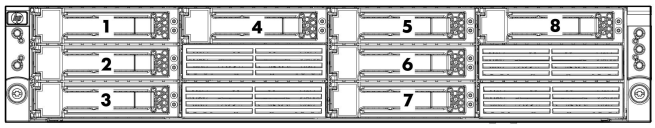
Memory

HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500668-B21
HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-B21
HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500672-B21
HP 4GB (1x4GB) Dual Rank x8 PC3L-10600 (DDR3-1333) Unbuffered CAS-9 Low Power Memory Kit	619488-B21

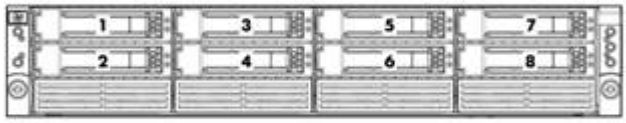
NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator.
NOTE: Kits described as LV include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient
NOTE: PC3L is a low voltage memory.

NOTE: There is a maximum support limitation of 8 ranks per memory channel (maximum of 2 quad rank DIMMs per channel)
NOTE: Memory Min and Max depends on number of processors and type of memory:

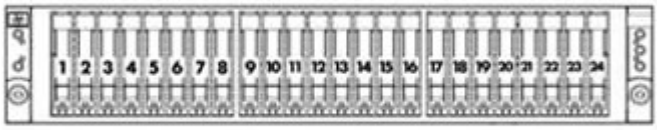
1. Processor -> R-Dimm: Min 1 // Max 8 U-Dimm: Min 1 // Max 6
2. Processors -> R-Dimm: Min 2 // Max 16 U-Dimm: Min 2 // Max 12



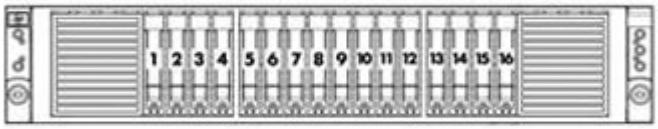
1-8 Eight 3.5" Hot-plug SAS/SATA hard drive bays (two node configuration)



1-8 Eight 3.5" Hot-plug SAS/SATA hard drive bays (four node configuration)



1-24 Twenty-four 2.5" Hot-plug SAS/SATA hard drive bays



1-16 Sixteen 2.5" Hot-plug SAS/SATA hard drive bays

Drive Support

Removable Media

	Quantity Supported	Position Supported	Controller
DVD-ROM	Up to 2 per node	External	USB
DVD/CD RW	Up to 2 per node	External	USB

Storage

Hard Drives

NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
900GB 6G SAS 10K DP 600GB 6G SAS 10K DP 450GB 6G SAS 10K DP 300GB 6G SAS 10K DP 146GB 6G SAS 15K DP 146GB 6G SAS 10K DP 72GB 6G SAS 15K DP	24	1-24	HP Smart Array P212/Zero Memory Controller HP Smart Array P212/256 MB Controller HP Smart Array P410/256 MB Controller HP Smart Array P410/512 MB BBWC Controller

SAS Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
600GB 6G SAS 15K DP 450GB 6G SAS 15K DP 300GB 6G SAS 15K DP	Up to 8	1-8	HP Smart Array P212/Zero Memory Controller HP Smart Array P212/256 MB Controller HP Smart Array P410/256 MB Controller HP Smart Array P410/512 MB BBWC Controller

SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
1TB 6G SAS 7.2K 500GB 6G SAS 7.2K	Up to 24	1-24	HP Smart Array P212/Zero Memory Controller HP Smart Array P212/256 MB Controller HP Smart Array P410/256 MB Controller HP Smart Array P410/512 MB BBWC Controller

SAS Hot Plug LFF (3.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
2TB 6G SAS 7.2K 1TB 6G SAS 7.2K	Up to 8	1-8	HP Smart Array P212/Zero Memory Controller HP Smart Array P212/256 MB Controller HP Smart Array P410/256 MB Controller HP Smart Array P410/512 MB BBWC Controller

SATA Hot Plug SFF (2.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller

Storage

1TB 3G SATA 7.2K 500GB 3G SATA 7.2K 160GB 3G SATA 7.2K	24	1-24	Embedded HP Smart Array Hot Plug Advanced Pack for B110i (RAID 0, 1, 10) HP Smart Array P212/Zero Memory Controller HP Smart Array P212/256 MB Controller HP Smart Array P410/256 MB Controller HP Smart Array P410/512 MB BBWC Controller

SATA Hot Plug LFF (3.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
2TB 3G SATA 7.2K 1TB 3G SATA 7.2K 500GB 3G SATA 7.2K	Up to 8	1-8	Embedded HP Smart Array Hot Plug Advanced Pack for B110i (RAID 0, 1, 10) HP Smart Array P212/Zero Memory Controller HP Smart Array P212/256 MB Controller HP Smart Array P410/256 MB Controller HP Smart Array P410/512 MB BBWC Controller

SATA Hot Plug Midline (MDL) Solid State Drives

	Quantity Supported	Position Supported	Controller
120GB 3.0G SATA SSD 60GB 3.0G SATA SSD	24	1-24	Embedded HP Smart Array Hot Plug Advanced Pack for B110i (RAID 0, 1, 10) HP Smart Array P212/Zero Memory Controller HP Smart Array P212/256 MB Controller HP Smart Array P410/256 MB Controller HP Smart Array P410/512 MB BBWC Controller

SATA Hot Plug 3.5" Midline (MDL) Solid State Drives

	Quantity Supported	Position Supported	Controller
120GB 3.0G SATA SSD 60GB 3.0G SATA SSD	Up to 8	1-8	Embedded HP Smart Array Hot Plug Advanced Pack for B110i (RAID 0, 1, 10) HP Smart Array P212/Zero Memory Controller HP Smart Array P212/256 MB Controller HP Smart Array P410/256 MB Controller HP Smart Array P410/512 MB BBWC Controller

Power Specifications

HP 750W Common Slot Platinum Hot Plug Power Supply Kit							
Part Number	593831-B21						
Input Voltage Range (V rms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	100	120	200	208	220	230	240
Maximum Rated Output Wattage Rating	750	750	750	750	750	750	750
Nominal Input Current (A rms)	8.6	7.1	4.2	4.0	3.8	3.6	3.4
Maximum Rated Input Wattage Rating (Watts)	841	828	809	808	807	806	805
Maximum Rated VA (Volt-Amp)	863	850	830	829	828	827	826
Efficiency (%)	89.2	90.6	92.7	92.8	93	93.1	93.2
Power Factor	0.985						
Leakage Current (mA)	0.42	0.50	0.83	0.87	0.92	0.96	1.00
Maximum Inrush Current (A peak)	30						
Maximum Inrush Current duration (mS)	20						
Maximum British Thermal Unit Rating (BTU-Hr)	2868	2825	2761	2757	2753	2749	2747

HP 1200W Common Slot Platinum Hot Plug Power Supply Kit							
Part Number	578322-B21						
Input Voltage Range (V rms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	100	120	200	208	220	230	240
Maximum Rated Output Wattage Rating	800	900	1200	1200	1200	1200	1200
Nominal Input Current (A rms)	9.3	8.6	6.7	6.5	6.1	5.8	5.6
Maximum Rated Input Wattage Rating (Watts)	889	989	1290	1290	1290	1290	1290
Maximum Rated VA (Volt-Amp)	927	1031	1345	1345	1345	1345	1345
Efficiency (%)	90	91	93	93	93	93	93
Power Factor	0.97						
Leakage Current (mA)	0.42	0.50	0.83	0.87	0.92	0.96	1.00
Maximum Inrush Current (A peak)	30						
Maximum Inrush Current duration (mS)	10						
Maximum British Thermal Unit Rating (BTU-Hr)	3033	3375	4403	4403	4403	4403	4403

Power Specifications

HP 1200W Common Slot Silver Hot Plug Power Supply Kit							
Part Number	500172-B21						
Input Voltage Range (V rms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	100	120	200	208	220	230	240
Maximum Rated Output Wattage Rating	800	900	1200	1200	1200	1200	1200
Nominal Input Current (A rms)	9.7	9.0	7.0	6.8	6.4	6.1	5.9
Maximum Rated Input Wattage Rating (Watts)	930	1034	1348	1348	1348	1348	1348
Maximum Rated VA (Volt-Amp)	970	1079	1406	1406	1406	1406	1406
Efficiency (%)	86	87	89	89	89	89	89
Power Factor	0.97						
Leakage Current (mA)	0.42	0.50	0.83	0.87	0.92	0.96	1.00
Maximum Inrush Current (A peak)	30						
Maximum Inrush Current duration (mS)	20						
Maximum British Thermal Unit Rating (BTU-Hr)	3174	3530	4600	4600	4600	4600	4600

To review typical system power ratings use the Active Answers HP Power Advisor which is available via the online tool located at URL: www.hp.com/go/proliant-energy-efficient or www.hp.com/go/hppoweradvisor

System Specifications

Power		
ProLiant DL170e G6 Fully Configured	115V/60Hz	220V/50Hz
Fully Loaded System Input Wattage (W)	651	638
Fully Loaded System Input Current (A rms)	5.7	3.0
Fully Loaded System Thermal (BTU- Hr)	2218	2174
Fully Loaded System VA (Volt-Amp)	657	657
System Leakage with all power supplies loaded (mA)	1.58	3.03
System Inrush Current with all power supplies loaded (A)	19	37
Power cord requirements	Nema 5-15P to IEC320-C13	IEC320-C13 to IEC320-C14
NOTE: Power shown is for a fully configured system consisting of (2) CPUs, (16) DIMMs, (2) HDDs, and (1) PCI card per node.		
Power Cord		AF556A

Server Power Cords

One 6' Highline (IEC-IEC) power cord ships standard

NOTE: ProLiant DL servers are primarily connected to PDU's in data center racks so they ship standard with only a PDU power cord (416151-B21). If a user wishes to power a ProLiant DL server using a 110V receptacle (NEMA-15), the NEMA power cord (227099-001) must be ordered separately.

NOTE: If customers require a power cord, they can check the power cord matrix for the appropriate cord. Please see the following power cord matrix: http://www.hp.com/go/powercordmatrix.

System Unit	**Dimensions** (H x W x D) (with bezel)	3.44 x 17.64 x 28.91 in (8.74 x 44.81 x 73.43 cm)	
	Weight (approximate)	Maximum (all hard drives, power supplies, and processors installed)	77.00 lb (34.93 kg)
		Minimum (one hard drive, power supply, and processor installed)	49.00 lb (22.22 kg)
	Input Requirements (per power supply)	Rated Line Voltage	90 to 140 VAC 180 to 264 VAC
		Rated Input Current	7.31A at 115VAC 3.6A at 230VAC
		Rated Input Frequency	47 to 63 Hz
		Rated Input Power	855W (at 100 VAC), 840.72W (at 200 VAC)
	Power Specifications	NOTE: To review typical system power ratings use the HP Power Advisor which is available online located at url: www.hp.com/go/proliant-energy-efficient or www.hp.com/go/hppoweradvisor	
	Power Supply Output (per power supply)	Rated Steady-State Power	653.10W (at 100 VAC), 653.08W (at 200 VAC)
	System Inlet Temperature	Operating	50° to 95° F (10° to 35° C) at sea level with an altitude derating of 1.8°F per every 1000 ft (1.0°C per every 305 m) above sea level to a maximum of 10,000 ft (3050 m), no direct sustained sunlight. Maximum rate of change is 18°F/hr (10°C/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 86°F (30°C).
		Non-operating	40° to 140° F (-40° to 60° C) Maximum rate of change is 36°F/hr (20°C/hr).
	Relative Humidity (non-condensing)	Operating	10% to 85% relative humidity (Rh), 82.4°F (28°C) maximum wet bulb temperature, non-condensing.
		Non-operating	10% to 95% relative humidity (Rh), 101.7°F (38.7°C) maximum wet bulb temperature, non-condensing.
	Altitude	Operating	10,000 ft (3050 m). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 1500 ft/min (457 m/min).
		Non-operating	30,000 ft (9144 m). Maximum allowable altitude change rate is 1500 ft/min (457 m/min).
	Acoustic Noise	Listed are the declared A-Weighted sound power levels (LWAd) and declared	

		average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109). The listed sound levels apply to minimally populated shipping configurations. Additional options may result in increased sound levels.	
		Node type	1U / 2U
		Idle	
		L_{WAd}	6.4 B / 6.5 B
		L_{pAm}	47 dBA / 48 dBA
		Operating	
		L_{WAd}	6.4 B / 6.5 B
		L_{pAm}	47 dBA / 48 dBA
	Emissions Classification (EMC)	FCC Rating	Class A
		Normative Standards	CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; GB9254; K22;K24; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1
		NOTE: Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.	
HP Smart Array B110i SATA RAID Controller	Simultaneous drive transfer channels	4 channels	
	Transfer rate synchronous (maximum theoretical)	1.5 Gb/s	
	Data transfer method	Intel® ICH10R	
	Drive support	Serial ATA	
	Data transfer modes	Legacy Mode Combined Mode	
	Protocol	Serial ATA	
	Feature	NCQ (Native Command Queuing); AHCI (Advanced Host Controller Interface)	
	RAID levels supported	0, 1, 10	
	RAID Features	Supports multiple logical volumes Setup through ROM based Array Configuration Utility Installation scripting support NOTE: Hot-Plug functions require the purchase of the HP Smart Array Hot Plug Advance Pack for B110i.	
	RAID OS Support	Microsoft Windows Server 2003 x32 and x64 Editions Microsoft Windows Server 2008 x32 and x64 Editions. Red Hat Enterprise Linux 4 (x86) Red Hat Enterprise Linux 5 (x86) Red Hat Enterprise Linux 5 (AMD64/EM64T) SUSE Linux Enterprise Server 10 (x86)	

		SUSE Linux Enterprise Server 10 (AMD64/EM64T) SUSE Linux Enterprise Server 11 (x86) SUSE Linux Enterprise Server 11 (AMD64/EM64T)
Embedded NC362i PCIe Gigabit Server Adapter	Network Interface	Integrated 10/100/1000BASE-T Transceiver Combines a triple-speed IEEE 802.3TM - Compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver.
	Data Transfer Method	Compliant to x4 PCIe Specification
	Controller	Intel® 82576
	Network Transfer Rate	10Base-T (Half-Duplex) 10 Mb/s 10Base-T (Full-Duplex) 20 Mb/s 100Base-TX (Half-Duplex) 100 Mb/s 100Base-TX (Full-Duplex) 200 Mb/s 1000Base-TX (Half and Full-Duplex) 2000Mb/s
	Connector	RJ-45 connector
	Cable Support	Performs all the physical layer functions for 10BASE-T, 100BASE-T, and 1000BASE-T Ethemet on standard Category 5 UTP
Environment-friendly Products and Approach	End-of-life Management and Recycling	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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For hard drives, 1GB = 1 billion bytes. Actual formatted capacity is less.